

AUSTRALIAN COMMISSION  
ON SAFETY AND QUALITY IN HEALTH CARE

TRIM: D17-49576

March 2018

# *Clostridium difficile* infection

2016 Data Snapshot

Published by the Australian Commission on Safety and Quality in Health Care  
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ISBN: 978-1-922563-24-8

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Australian Commission on Safety and Quality in Health Care. Clostridium difficile infection 2016 Data Snapshot. Sydney: ACSQHC; 2018

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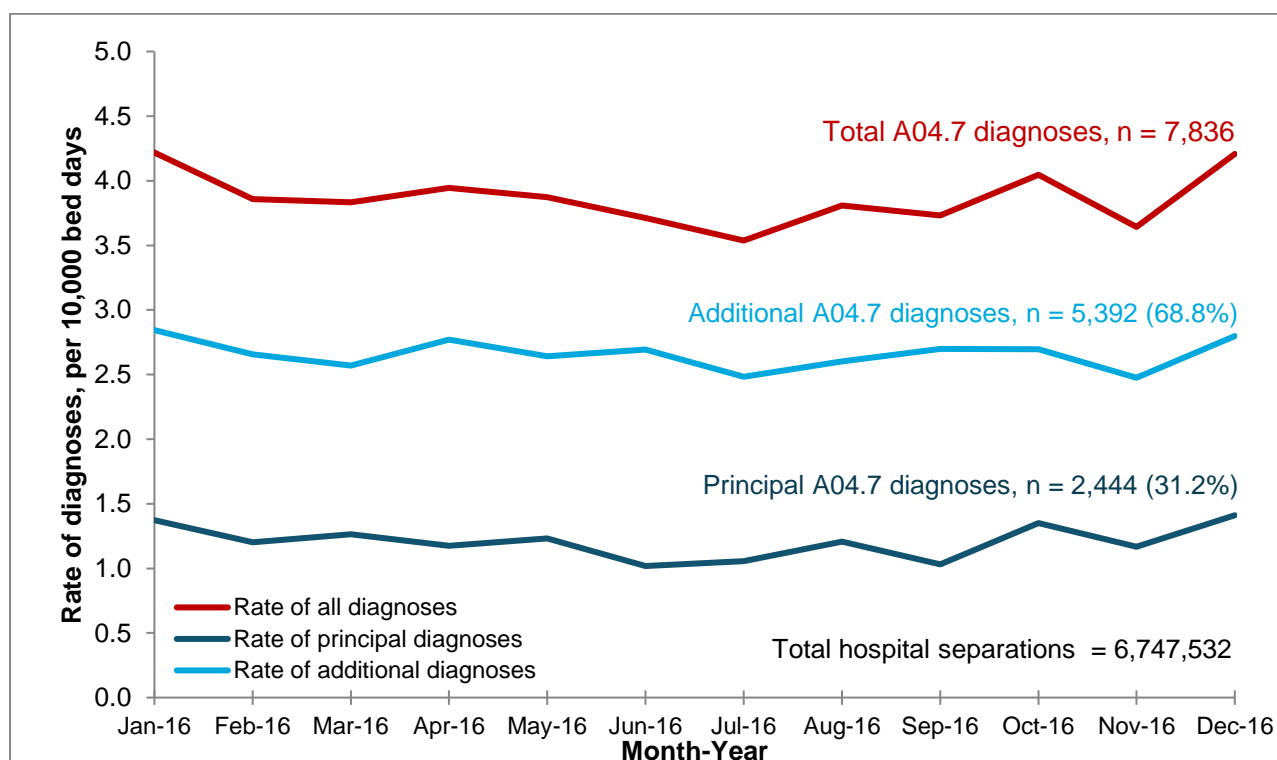
## Background

The usefulness of patient administrative data for monitoring the national prevalence of *Clostridium difficile* infection (CDI) was previously established by the Australian Commission on Safety and Quality (the 'Commission') in 2017 from data collected between 2011 and 2016. This earlier work found that administrative data is demonstrably sufficient for informing on the relative increases and decreases in CDI prevalence at a national level. In October 2017, the Commission's Inter Jurisdictional Committee supported this mechanism be used by the Commission to annually monitor CDI in Australia.

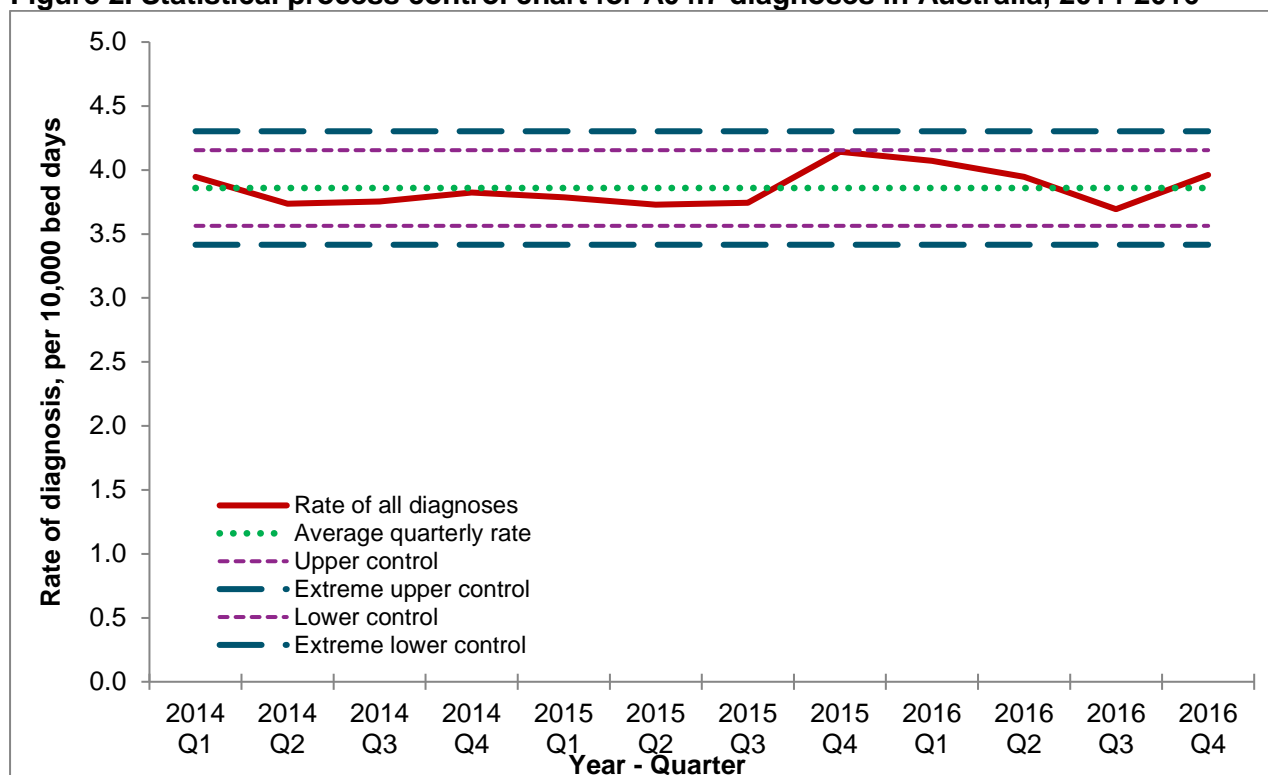
This Snapshot reports on the prevalence of CDI in Australia during 2016. The analysis uses administrative data that is collected in the Admitted Patient Care National Minimum Data Set (APC NMDS) and uses separations for admitted patients in Australian public hospitals only. No exclusion or filtering criteria has been applied to the APC NMDS. Data are based on the state or territory of the hospital that collected the data, not the state or territory where the patient resides. For the purposes of this analysis, the diagnosis code A04.7 *Gastroenterocolitis caused by Clostridium difficile* was used to identify separations affected by CDI.

## Prevalence of CDI in Australia

Figure 1. A04.7 diagnoses in all Australia public hospitals (n=696), 2016



**Figure 2. Statistical process control chart for A04.7 diagnoses in Australia, 2014-2016**



**Table 1. Comparison of average yearly rate of CDI diagnoses**

Year	Average yearly rate per 10,000 bed days		
	Principal A04.7 diagnosis	Additional A04.7 diagnosis	Any A04.7 hospital diagnosis
2012	1.21	3.10	4.30
2013	1.13	2.80	3.94
2014	1.08	2.74	3.81
2015	1.11	2.74	3.85
2016	1.23	2.68	3.91

## Commentary

Over 2016, the rate of all A04.7 diagnoses varied between 3.5 and 4.3 diagnoses per 10,000 bed days (Figure 1). The rate was highest in January and lowest in July. The average rate of any A04.7 diagnoses was 3.9 per 10,000 bed days; this rate is slightly higher than the average rate observed in 2014 and 2015. This increase was driven by an increase the rate of principal A04.7 diagnoses as this rate has increased from 1.11 diagnoses per 10,000 bed days in 2015 to 1.23 diagnoses per 10,000 bed days in 2016 (Table 1). In contrast, the average rate of additional A04.7 diagnoses decreased from 2.74 diagnoses per 10,000 bed days in 2015 to 2.68 diagnoses per 10,000 bed days in 2016.

Additional A047 diagnoses accounted for 68.8% of all A04.7 diagnoses in 2016 (Figure 1). This proportion is 2.4% less than what was observed in 2015 when additional A04.7 diagnoses accounted for 71.2% of all A04.7 diagnoses.

The rate of all A04.7 diagnoses remained within statistical process control limits throughout the entire year (Figure 2), indicating little evidence of a widespread disease outbreak during this period.

## Exposure

Figure 3. Breakdown of A04.7 additional diagnoses in Australian public hospitals, 2016\*

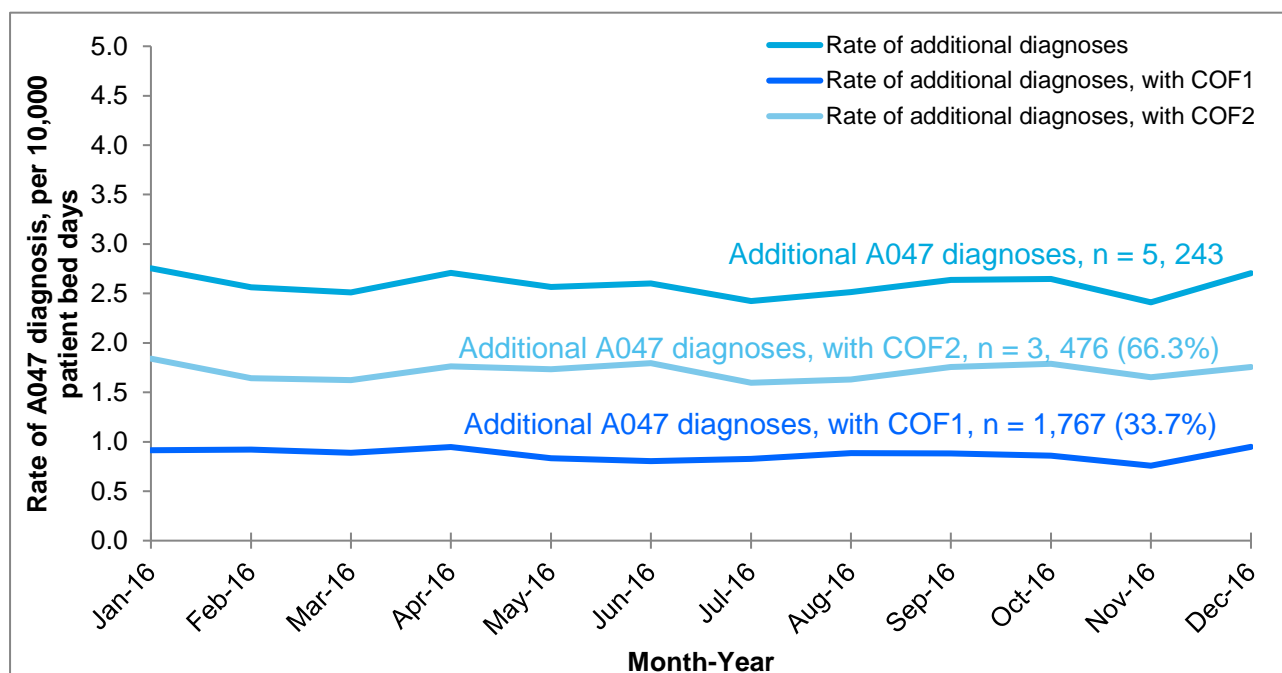
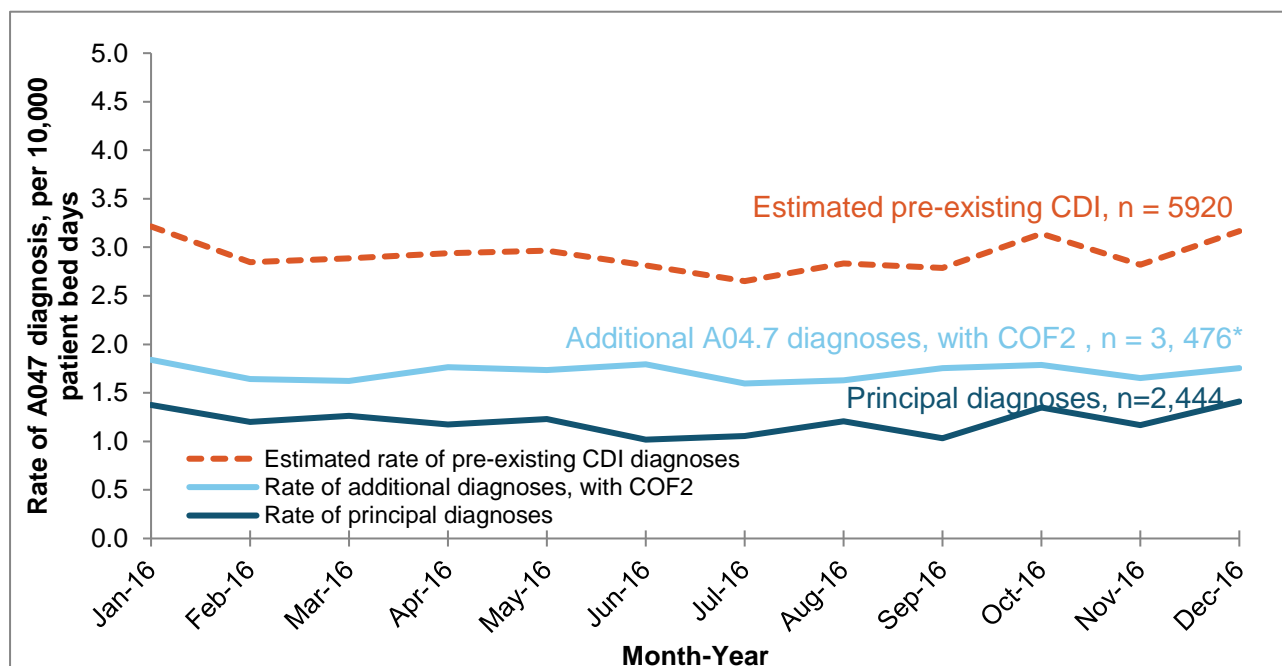


Figure 4. Estimated burden of pre-existing CDI presenting to hospitals, 2016



COF 1: Condition Onset Flag 1, refers to a condition that has arisen during the episode of admitted care that would not have been present or suspected on admission.  
 COF 2: Condition Onset Flag 2, refers to a condition previously existing or suspected on admission such as the presenting problem, a comorbidity or chronic disease.  
 For further information on Condition Onset Flags, see: Australian Institute of Health and Welfare. Episode of admitted patient care - condition onset flag, code N. [Online]; Available from: <http://meteor.aihw.gov.au/content/index.phtml/itemId/496512>

\* Based on hospitals with highly reliable COF coding (n=517)

**Table 2. Year-on-year comparison of A047-related separations (2015 vs 2016)**

	2015	2016	% Year on Year change
Number of separations in Australian public hospitals	6,367,291	6,747,532	+6.0%
Number of separations with a A04.7 diagnosis	7,550	7,836	+3.8%
Number of separations with a principal A04.7 diagnosis	2,178	2,444	+12.2%
Number of separations with an additional A04.7 diagnosis	5,372	5,392	+0.4%
Number of separations with an additional A0.47 diagnosis, with COF1*	1,885	1,767	-6.3%
Number of separations with an additional A04.7 diagnosis, with COF2*	3,365	3,476	+3.3%
Estimated pre-existing burden <i>Principal A04.7 + Additional A04.7, COF2*</i>	5,543	5,920	+6.8%

\* Based on hospitals with highly reliable COF coding only

## Commentary

Only a third of additional A04.7 diagnoses were related directly to the health care provided during the separation for which A04.7 diagnosis was assigned (Figure 3). The data suggests that 75.6% of CDI presenting to Australian hospitals in 2016 is due to previous exposure, either in the community or during a previous health care admission, and is not related to the health care delivered during the separation for which the diagnosis was assigned. This proportion has increased by 6.8% since 2015 (Table 2).

The rate of additional A04.7 diagnosis was highest in January and December. There was little variation in these rates throughout the year:

- The rate of additional A04.7 diagnoses ranged from 2.84 to 2.48 diagnoses per 10,000 patient bed days
- The rate of additional A04.7 diagnoses with COF1 ranged from 0.95 to 0.76 diagnoses per 10,000 bed days
- The rate of additional A04.7 diagnoses with COF2 ranged from 1.84 to 1.60 diagnoses per 10,000 bed days.

The overall number of hospital separations in Australia increased by 6.0% between 2015 and 2016. In comparison, the increase in the number of A04.7 diagnoses during the year was 3.8%. Most notably, principal A04.7 diagnoses increased by 12.2% while additional A04.7 diagnoses classified as COF1 (i.e. CDI attributable to healthcare delivery) decreased by 6.3% (Table 2).

## Burden

Table 3. Average length of stay associated with an A04.7 diagnosis, 2012-2016

Year	Average length of stay (bed days)		
	Any A04.7 diagnosis	Principal A04.7 diagnosis	Additional A04.7 diagnosis
2012	18.69	8.34	22.73
2013	17.17	7.91	20.91
2014	18.05	7.79	22.10
2015	16.91	7.60	20.68
2016	16.08	7.38	19.78
Overall average	17.41	7.81	21.28
Overall rate of change (slope), 2012-2016	-0.59	-0.22	-0.61

## Commentary

In 2016, the average length of stay associated with an additional A04.7 diagnosis was almost three times longer than the average length of stay associated with a principal A04.7 diagnosis in 2016 (Table 3).

The average length of stay associated with a CDI diagnosis (principal or additional) is decreasing ten times faster than the decrease associated with the average hospital stay (-0.59 days per year vs -0.07 days per year).



## Snapshot summary

The rate of CDI diagnoses slightly increased in 2016. This overall increase has been driven by a 12.2% increase in the rate of principal CDI diagnoses during this period. The rate of CDI directly attributable to health care delivery dropped by 6.6% in 2016, suggesting national improvement in hospital-based CDI prevention and control during this period. Patients with a CDI diagnosis continue to have substantially longer hospital stays than those without a CDI diagnosis, however the length of stay associated with a CDI diagnosis is decreasing over time.